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## Good wine -- a bouquet to science

By Jim Downing -- Bee Staff Writer

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The nation's leading nose experts, conferring at the Sacramento Convention Center through Friday, are formulating new ways to manipulate wine lovers, right down to their brain cells.

As these top wine researchers learn more about the chemistry behind wine flavor and aroma, they use it to give winemakers better control over the traits of the wines they create and provide consumers with a reliably enjoyable product.

Every bit of understanding helps in a business where subtle changes in taste or aroma can make the difference between a \$10 bottle of wine and one that sells for \$40.

"This is about going from good to great," said John Duarte, vice president of Duarte Nursery in Hughson, which specializes in wine-grape vines.

He was one of hundreds of industry veterans taking in the latest research at the annual meeting of the American Society for Enology and Viticulture. It's the largest wine science event of the year.

Experimentation has probably always been a part of the wine business. For centuries, winemakers have adjusted how grapes are cultivated, harvested and fermented, and then tasted the results.

Nathan Carlson, the winemaker at Tolosa Winery in San Luis Obispo, said this kind of basic science is still a regular part of winemaking.

"Every year, we set something up," he said, from a test to compare the effect of picking grapes by hand instead of by machine to an evaluation of how the size of his fermenting vat influences the taste of his wine.

Using tools that analyze the unique combination of chemicals that gives wine its flavor, laboratory researchers can help winemakers improve upon traditional trial-and-error work

For example, in sauvignon blanc grapes, researchers have isolated chemicals known as pyrazines. These compounds give sauvignon blanc a distinctive earthy, vegetable aroma and taste sometimes likened to potato or asparagus.

That collection of flavors, though, is best enjoyed in moderation.

"It's important to the character, but too much is too much," said Susan Ebeler, a professor of enology at the University of California, Davis.

Fortunately, there's a relatively simple solution. Researchers have found that pyrazines will breakdown if exposed to sunlight while the grapes are on the vine, according to Andrew Waterhouse, another UCD enology professor. By removing leaves from the upper branches of the vines before harvest, growers can expose the grapes to more sun, which translates to lower levels of pyrazines, and, if all goes well, better wine.

If the flavor of wine were determined by just a few different chemicals, making it taste very good might be fairly simple.

As it is, though, hundreds of chemicals contribute to the taste and smell of a glass of wine. Waterhouse said that researchers are just beginning to get a handle on the full complexity of flavor chemistry.

While researchers have found that our noses can detect, say, notes of artichoke or bell pepper in a glass of wine, they have also found that the human senses of smell and taste are swayed by input from our other senses, particularly sight.

For winemakers, that means the color of a wine may have a lot to do with how drinkers perceive its taste.

For instance, when research subjects taste samples of a white wine doctored with different amounts of red food coloring, they'll perceive the dark-colored wine as being more full-bodied and flavorful than the light-colored version, said Jannine Delwiche, an Ohio State University professor who studies sensory perception.

"I personally think this effect comes from a lifetime of making Kool-Aid," where more color really does mean more flavor, she said.

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